Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	
Amendment of Part 2 of the Commission's Rules to Allocate Spectrum Below 3 GHz for Mobile and Fixed Services to Support the Introduction of New Advanced Wireless Services, Including Third Generation Wireless Systems	ET Docket No. 00-258
Amendment of Section 2.106 of the Commission's Rules to Allocate Spectrum at 2 GHz for Use By the Mobile-Satellite Service	ET Docket No. 95-18
The Establishment of Policies and Service Rules for the Mobile-Satellite Service in the 2 GHz Band	IB Docket No. 99-81
Petition for Rule Making of the Wireless Information Networks Forum Concerning the Unlicensed Personal Communications Service	RM-9498
Petition for Rule Making of UTStarcom, Inc. Concerning the Unlicensed Personal Communications Service	RM-10024

REPLY COMMENTS OF MOTOROLA, INC.

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Summary

The record in this proceeding strongly supports the reallocation of the 1710-1770 MHz and 2110-2170 MHz bands for third generation ("3G') advanced wireless services. In Motorola's view, this represents the most viable option for making suitable spectrum available to meet the near-term demand for 3G services, and would provide much needed certainty regarding spectrum availability for the wireless industry and the investment community.

The record also supports maintaining the existing allocation of the 1910-1930 MHz band for unlicensed PCS ("UPCS"), rather than reallocating this spectrum for 3G services. Given that this band adjoins both the mobile transmit and base transmit PCS, deployment of 3G systems in the 1910-1930 MHz band would create a substantial risk of unacceptable interference between PCS and 3G devices. Motorola does support, however, allowing expanded uses of the 1910-1920 MHz sub-band for isochronous UPCS devices that meet the existing low power transmission limits.

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REPLY COMMENTS OF MOTOROLA, INC.

Motorola, Inc. hereby submits these reply comments on the *Further Notice of Proposed Rulemaking* ("*FNPRM*") in the above-captioned proceeding.[1] As discussed below, the record strongly supports the Commission's proposed reallocation of the 1710-1770 MHz and 2110-2170 MHz bands for third generation ("3G') advanced wireless services. This pairing option

[1] Amendment of Part 2 of the Commission's Rules to Allocate Spectrum Below 3 GHz for Mobile and Fixed Services to Support the Introduction of New Advanced Wireless Services, including Third Generation Wireless Systems, ET Docket No. 00-258, *Memorandum Opinion and Order and Further Notice of Proposed Rulemaking*, FCC 01-224 (rel. Aug. 20, 2001) (*"FNPRM"* or *"Further Notice"*).

has received widespread support from commenting parties, and it is clear that none of the other pairing options proposed by the Commission now enjoys anywhere near such wide support. Although not Motorola's preferred option, it represents the most viable option for making suitable spectrum available to meet the near-term demand for 3G services, and would provide much needed certainty regarding spectrum availability for the wireless industry and the investment community. As the President's Council of Economic Advisors has noted, the commencement of 3G services would generate additional annual service revenues and an enormous annual consumer surplus that would boost the U.S. economy.[2]

The record also supports maintaining the existing allocation of the 1910-1930 MHz band for unlicensed PCS ("UPCS"), rather than reallocating this spectrum for 3G services. Given that this band adjoins both the mobile transmit and base transmit PCS, deployment of 3G systems in the 1910-1930 MHz band would create a substantial risk of unacceptable interference between PCS and 3G devices. Motorola does support, however, allowing expanded uses of the 1910-1920 MHz sub-band for isochronous UPCS devices that meet the existing low power transmission limits.

I. The Record Supports the Commission's Proposal to Reallocate the 1710-1770 MHz and 2110-2170 MHz Bands for 3G Wireless Services

As discussed in Motorola's October 22 comments, Motorola supports the Commission's proposal to allocate the 1710-1770 MHz and 2110-2170 MHz bands for advanced wireless services, including 3G. This is not Motorola's preferred choice, however, as it will provide less advantageous harmonization with international band pairings than a 3G band plan that pairs

[2] *See* The Council of Economic Advisers, *Economic Impact of Third-Generation Wireless Technology*, Oct. 2000, at 6-8 ("CEA Report"); *see also* Comments of Motorola, Inc., Oct. 22, 2001, at 2-3 ("Motorola Comments").

spectrum within the 1710-1850 MHz band. But given the near-term demand for 3G services, the encumbered nature of the upper portion of the 1710-1850 MHz band, and the Government's concern about relocating various systems in that band in light of recent events, Motorola recognizes that the Commission's 1710-1770 MHz and 2110-2170 MHz band pairing proposal offers the most practical solution at this time.

Motorola is far from being alone in this position. Indeed, many commenters have joined Motorola in urging adoption of the Commission's latest band pairing option.[3] Many of these comments echo Motorola's view that the proposed band pairing will provide substantial harmonization benefits.[4] The 1710-1770 MHz band lies within the 1710-1885 MHz band identified for terrestrial International Mobile Telecommunications-2000 ("IMT-2000") use at the 2000 World Radiocommunication Conference ("WRC-2000")[5] and overlaps entirely with the European DCS-1800 mobile station transit spectrum, which occupies the 1710-1785 MHz band.[6] The 2110-2170 MHz band coincides with the terrestrial component of one of the IMT-2000 spectrum bands identified at the 1992 World Administrative Radio Conference ("WARC-

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[3] *See, e.g.*, Comments of AT&T Wireless Services, Inc., Oct. 22, 2001, at 2, 7 ("AT&T Wireless Comments"); Comments of the Cellular Telecommunications & Internet Association, Oct. 22, 2001, at 10-11 ("CTIA Comments"); Comments of Ericsson, Oct. 19, 2001, at 2 ("Ericsson Comments"); Comments of Qualcomm Incorporated, Oct. 22, 2001, at 2 ("Qualcomm Comments"); Comments of Verizon Wireless, Oct. 19, 2001, at 3 ("Verizon Wireless Comments"); Comments of the Wireless Communications Division of the Telecommunications Industry Association, Oct. 22, 2001, at 2-3 ("WCD-TIA Comments"); *see also* Comments of Cingular Wireless LLC, Oct. 22, 2001, at 11 ("Cingular Wireless Comments") (advocating pairing of the 1710-1780 MHz and 2110-2180 MHz bands); Comments of Telephone and Data Systems, Inc., Oct. 19, 2001, at 8 ("TDS Comments") (advocating reallocation of the 2110-2180 MHz band for 3G).

[4] *See, e.g.*, Cingular Wireless Comments at 12, 14; CTIA Comments at 10; Ericsson Comments at 9-10; Qualcomm Comments at 3-4; Verizon Wireless Comments at 13; WCD-TIA Comments at 4-5.

[5] *See Final Acts of the World Radiocommunication Conference* (Istanbul, WRC-2000), Resolution 223, *Additional frequency bands identified for IMT-2000*.

[6] *See* Motorola Comments at 5.

92")[7] has been designated as the base station transmit portion of the terrestrial Universal Mobile Telecommunications System ("UMTS") "core band," and corresponds to terrestrial 3G spectrum allocations in many countries, including Brazil, Japan and Korea.[8] The Commission's proposed band pairing would thus achieve considerable harmonization with spectrum that is being used for mobile applications throughout much of the world, and should ensure that the U.S. achieves the substantial economic benefits that are predicted to flow from a significant degree of harmonization of 3G spectrum.[9]

The record supports Motorola's position that existing Government incumbents in the 1710-1770 MHz band can be accommodated, through a combination of spectrum sharing and relocation of incumbents to comparable spectrum.[10] Moreover, there is unquestioned industry support for compensation of incumbents whenever relocation is required.[11] Further, the record also shows support for Motorola's position, advocated in earlier comments on the January 5,

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7 *See Final Acts of the World Administrative Radio Conference* (Malaga-Torremolinos, 1992); *see also* Amendment of Part 2 of the Commission's Rules to Allocate Spectrum Below 3 GHz for Mobile and Fixed Services to Support the Introduction of New Advanced Wireless Services, including Third Generation Wireless Systems, ET Docket No. 00-258, *Notice of Proposed Rulemaking*, 16 FCC Rcd 596 (2001) ("*NPRM*"), ¶ 4. WARC-92 identified the 2110-2200 MHz band for possible 3G use, with the 2110-2170 MHz portion of the band identified for terrestrial use. *See NPRM*, Appendix G.

8 *See* Motorola Comments at 6.

9 *See id*. at 3, 5-6; *see also CEA Report* at 11-12, 14; *Final Acts of the World Radiocommunication Conference* (Istanbul, 2000), Resolution 223, § m.

10 *See* Joint Comments of the Cellular Telecommunications & Internet Association, Telecommunications Industry Association and Personal Communications Industry Association ("Association Group"), Feb. 22, 2001, Report of the Industry Association Group on Identification of Spectrum for 3G Services, at 1-11; CTIA Comments at 11; Ericsson Comments at 14-15; Motorola Comments at 7-12; Verizon Wireless Comments at 5-6.

11 *See, e.g*., Ericsson Comments at 14-15; Motorola Comments at 3, 8, 13, 14; Comments of Nortel Networks Inc., Oct. 19, 2001, at 5-6 ("Nortel Comments"); Verizon Wireless Comments at 6. No commenters oppose reimbursement of incumbents' relocation costs.

2001 *NPRM*,[12] that proceeds from the 3G auction should be used to fund the relocation of incumbents displaced by the 3G spectrum reallocation.[13]

Although there is considerable support for the 1710-1770 MHz and 2110-2170 MHz band pairing, many commenters, including Motorola, have cautioned that the 120 MHz of spectrum that would be made available for 3G under this option would be insufficient to meet the anticipated demand for 3G services.[14] The industry consensus is that 160-200 MHz of spectrum in addition to existing first and second generation wireless spectrum will be needed to meet the demand for 3G services over the next decade.[15] The record is clear that additional spectrum allocations will be necessary to meet the escalating demand for 3G wireless services by the end of the decade, and that the Commission should thus move to identify additional spectrum for 3G once the initial reallocation of 120 MHz is complete.[16]

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12 *See* Comments of Motorola, Inc., Feb. 22, 2001, at 14-15 ("Motorola NPRM Comments"); Reply Comments of Motorola, Inc., Mar. 9, 2001, at 8 ("Motorola NPRM Reply").

13 *See* Ericsson Comments at 14-15; Verizon Wireless Comments at 6.

14 *See* Cingular Wireless Comments at 11 (proposing a band plan that would make 190 MHz of spectrum available for 3G); CTIA Comments at 12; Ericsson Comments at 3 (proposing additional allocations in two phases); Motorola Comments at 4; TDS Comments at 5; Verizon Wireless Comments at 12; WCD-TIA Comments at 8.

15 *See* AT&T Wireless Comments at 2 ("at least 160 MHz"); Cingular Wireless Comments at 6 ("at least 200 MHz"); CTIA Comments at 10 (200 MHz); Motorola Comments at 2 (160-200 MHz); Comments of Nortel Networks, Inc., Feb. 22, 2001, at 3 (160 MHz); Comments of the Personal Communications Industry Association, Feb. 22, 2001, at 7 ("at least 160 MHz"); Comments of Qwest Wireless, LLC, Feb. 22, 2001, at 4 (160 MHz); Comments of the Telecommunications Industry Association, Feb. 22, 2001, at 2-3 (200 MHz); TDS Comments at 5 (160-180 MHz); Verizon Wireless Comments at 2 (additional 200 MHz required to achieve total mobile spectrum allocation of 390 MHz); WCD-TIA Comments at 8 (160-200 MHz).

16 *See* CTIA Comments at 12; Motorola Comments at 4; TDS Comments at 5; Verizon Wireless Comments at 12; WCD-TIA Comments at 8.

A. The Record Supports Reallocation of a Portion of the Mobile Satellite Service Spectrum

Motorola supports the Commission's proposal to reallocate 10-14 MHz of the spectrum that is presently allocated for mobile satellite service ("MSS") in the 1990-2025 MHz and 2165-2200 MHz bands for either 3G services or displaced incumbents.[17] At a minimum, Motorola urges the Commission to reallocate the 2165-2170 MHz segment of the upper MSS band for 3G services to create a contiguous 2110-2170 MHz band that is consistent with the IMT-2000 terrestrial band identified at WARC-92.[18]

There is widespread support in the record for reallocation, at a minimum, of the 14 MHz of MSS spectrum that remains unassigned following the withdrawal of one MSS operator.[19] Motorola joins other commenters in supporting efficient assignment of MSS spectrum to MSS licensees. To that end, many commenters urge the Commission to ensure that MSS licensees are assigned contiguous spectrum, thus preventing "orphaned" slivers of spectrum if other MSS licensees fail to deploy in their assigned spectrum and that spectrum is recovered for other services.[20] Motorola supports this approach. Moreover, because reallocation of the 2165-2170 MHz spectrum for 3G services is critical to creating a contiguous 60 MHz spectrum block at 2110-2170 MHz, Motorola joins the numerous commenters that

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17 *See FNPRM*, ¶ 24; Motorola Comments at 12-13.

18 *See supra* pp. 3-4; Motorola Comments at 12-13.

19 *See FNPRM*, ¶ 15; AT&T Wireless Comments at 7; CTIA Comments at 5; Ericsson Comments at 11; Nortel Comments at 6; TDS Comments at 7; Verizon Wireless Comments at 12; WCD-TIA Comments at 6. AT&T Wireless notes that one of the MSS licensees that has commenced operations, Globalstar, L.P., has only 55,000 subscribers, reflecting only limited demand for MSS service. *See* AT&T Wireless Comments at 7. It notes too that the MSS industry has less than 1 percent of the subscriber base currently held by CMRS providers. *See id*. at 8.

20 *See* AT&T Wireless Comments at 9; CTIA Comments at 8; Ericsson Comments at 12-13; Nortel Comments at 6; TDS Comments at 7-8; WCD-TIA Comments at 7.

urge the Commission to ensure that MSS spectrum assignments are made from the top down, i.e., beginning from 2200 MHz and working downwards.[21] CTIA observes, too, that a "top down" assignment process would "create the least interference to adjacent services."[22] This provides yet further justification for the Commission to adopt a "top down" assignment requirement.

B. The Record Supports Reallocation of the 2150-2162 MHz Band for Advanced Wireless Services

The Commission's 1710-1770 MHz and 2110-2170 MHz band pairing option would require relocation of existing multipoint distribution service ("MDS") licensees operating in the 2150-2162 MHz band, because co-channel sharing of MDS and 3G licensees would result in unacceptable interference.[23] Relocation of incumbent MDS licensees would enable a contiguous 60 MHz block of spectrum to be reallocated for 3G, making the potential of a global IMT-2000 base station transmit band at 2110-2170 MHz a reality.[24] Incumbents should be relocated to comparable spectrum and fully reimbursed for their relocation costs.[25] Motorola and other commenters support the use of 3G auction proceeds to fund compensation of incumbents' relocation costs.[26]

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21 *See* AT&T Wireless Comments at 9; CTIA Comments at 8; Ericsson Comments at 12-13; Nortel Comments at 6 (supporting retention of MSS spectrum at the upper ends of the 1990-2025 MHz and 2165-2200 MHz bands); WCD-TIA Comments at 7.

22 CTIA Comments at 8.

23 *See* Verizon Wireless Comments at 9.

24 *See* AT&T Wireless Comments at 5-6; Cingular Wireless Comments at 13-14; CTIA Comments at 8-9, 10; Ericsson Comments at 8-10; Verizon Wireless Comments at 7-8; WCD-TIA Comments at 4-5.

25 *See* Motorola Comments at 13, 14.

26 *See* Motorola NPRM Comments at 14-15; Motorola NPRM Reply at 8; Ericsson Comments at 14-15; Verizon Wireless Comments at 6.

The record demonstrates support for the two relocation options identified in Motorola's October 22 comments.[27] The first option is to relocate MDS incumbents to the 2385-2400 MHz band.[28] This option would provide MDS licensees with a comparable amount of spectrum while also providing sufficient spectrum for guardbands, if needed to moderate adjacent channel protection.

The Ad Hoc MDS Alliance argues, however, that MDS relocation spectrum should come from bands below 2150 MHz so that additional infrastructure is not needed to overcome propagation differences found at higher frequencies.[29] Relocating MDS operations on Channels 1, 2 and 2A to the 2390-2400 MHz band should not raise this concern. Based on ITU-R Draft New Recommendation P.1546 (*Method for point-to-area predictions for terrestrial services in the frequency range of 30 to 3 000 MHz*), it appears that there is approximately a 0.25 dB difference in propagation loss between 1910 and 2400 MHz.[30] Thus, from a technical stand point, the 1910 MHz and 2400 MHz bands are equivalent.

Comments filed by the American Radio Relay League ("ARRL") indicate that sharing between Amateur Service users and commercial services, including MDS, in the 2390-2400

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[27] Nucentrix raises a valid point in that relocation of MDS incumbents in the 2150-2162 MHz band may require the Commission to engage in a frequency coordination process with Mexico and Canada. *See* Comments of Nucentrix Broadband Networks, Inc., Oct. 22, 2001, at 6. While such coordination may indeed be necessary, this process should not discourage the implementation of spectrum allocation policies that serve the public interest nor should it be a reason for maintaining the current allocation of the 2150-2162 MHz band for MDS.

[28] *See* Motorola Comments at 13-14.

[29] *See* Comments of the Ad Hoc MDS Alliance, Oct. 22, 2001, at 6 ("MDS Alliance Comments").

[30] Computed at distances of 10-40 km from a transmitter of height of 500 m and 10 m receiver height. If the transmitter height is reduced to 50 meters then the difference in propagation loss is less than 0.7 dB. Also, assuming that MDS operations would use the same antenna size, with same efficiency, they would gain nearly 4 dB. For example, a 1-foot antenna with 50 percent efficiency would have a peak gain of 14.6 dB at 2.4 GHz and 12.69 dB at 1.91 GHz. Thus, from a technical stand point, the 1910 MHz and 2400 MHz bands are equivalent.

MHz band may be problematic.[31] In particular, the ARRL asserts that amateur television and mobile data communications within this band "cannot be coordinated with non-Amateur fixed or mobile facilities, and therefore are fundamentally incompatible."[32] Motorola encourages the Commission to investigate the extent to which sharing can be achieved in the 2390-2400 MHz band. Although some disruption of a limited number of Amateur users may occur, this should not be allowed to stand in the way of reallocation of the 2390-2400 MHz band and, ultimately, the establishment of a contiguous 3G downlink band at 2110-2170 MHz.

The second relocation option proposed by Motorola is to relocate MDS licensees in the 2150-2162 MHz band to a portion of the 1990-2025 MHz MSS band.[33] As noted in the previous section, the record supports reallocation of a minimum of 14 MHz of the MSS spectrum, consistent with the Commission's proposal.[34] If the Commission reallocates a sufficient amount of spectrum, the 2010-2025 MHz band would be a suitable band for relocation of the MDS operations from 2150-2162 MHz and should allow for a sufficient guardband to protect for adjacent channel operations. Other commenters support relocation of 2.1 GHz MDS licensees to the 2010-2025 MHz band.[35]

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31 *See* Comments of ARRL, The National Association for Amateur Radio, Oct. 19, 2001, at 9-10 ("ARRL Comments").

32 *Id*. at 10.

33 *See* Motorola Comments at 14.

34 *See supra* p. 6.

35 *See, e.g.*, Cingular Wireless Comments at 13-14; *see also* Ericsson Comments at 10-11 (suggesting relocation of MDS licensees to the 1990-2025 MHz band if "MDS market development indicates a clear need for replacement of the channels in the 2150-2162 MHz band.").

To ensure that incumbent MDS licensees are fairly treated under either relocation option discussed above, Motorola and other industry members support full compensation for all reasonable costs associated with relocation.[36]

II. The Record Supports Permitting Expanded Use Of The 1910-1930 MHz Band, Including Cross-Over Use Of Isochronous Devices In The Asynchronous Band.

As expressed in Motorola's initial comments, the UPCS band currently supports hundreds of thousands of users; indeed, as the record more than demonstrates, saturation has been reached in certain high-density, geographic-specific locations within the isochronous band. For this reason, many commenters join Motorola in urging the Commission to permit flexible use of the 1910-1920 MHz band, particularly for deployment of isochronous devices. Motorola cautions the Commission, however, to refrain from amending the Part 15 etiquette to permit high-powered uses in these frequencies—such as high-powered TDD operations—in order to maintain the integrity of UPCS operations and guard against interference to adjacent, licensed uses.

A. Additional Flexibility Within the 1910-1920 MHz Band Will Ensure Efficient Use of the Asynchronous Band While Accommodating End User Needs.

The record indicates overwhelming support for permitting flexible use of the asynchronous band, in order to accommodate the increasing demand for isochronous UPCS devices.[37] At present, the 1920-1930 MHz band provides services to a wide array of end users,

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[36] *See* Ericsson Comments at 14-15; Motorola Comments at 13, 14; Nortel Comments at 5-6; Verizon Wireless Comments at 6.

[37] *See, e.g.*, Comments of Avaya, Oct. 19, 2001, at 5 ("Avaya Comments"); Comments of NEC America, Inc., Oct. 22, 2001 at 24-25 ("NEC Comments"); Comments of UTAM, Oct. 19, 2001 at 11-15 ("UTAM Comments"); Comments of the Rural Telecommunications Group, Oct. 22, 2001 at 6-7; *see also* Comments of Blackfoot Telephone Cooperative, Inc., Oct. 22, 2001 at 3; Comments of Midstate Communications, Inc., Oct. 22, 2001 at 3; Comments of Midvale Telephone Exchange, Inc., Oct. 22, 2001 at 3; Comments of Penasco Valley

from trading exchanges to hospitals to prisons to universities.[38] For example, UTAM—the designated frequency coordinator for the UPCS band—notes that UPCS devices are employed by doctors and nurses in hospitals, who consequently are able to move freely about the hospital wards while remaining accessible to other hospital staff.[39] Recently, at Ground Zero in New York—as other, licensed wireless systems reached full capacity—UPCS systems could be deployed swiftly to meet communications needs without any attendant delays for coordination.[40] The swiftness and relative reliability of communications—assured by the strict Part 15 etiquette—also makes UPCS devices optimal for PBX users who desire a mobility solution.[41] In fact, the record indicates that present demand for UPCS has reached saturation in certain areas and, for this reason, commenters support the Wireless Information Networks Forum's ("WINForum") request for release of the entire UPCS band for isochronous use.[42] As WINForum explains, flexibility to deploy isochronous devices in the 1910-1920 MHz band would (1) "confer substantial long-term benefits, particularly in high-density areas such as multi-tenant high-rises and industrial parks"; (2) "allow UPCS to utilize base stations and switching circuits more effectively"; and (3) "facilitate the coexistence of different UPCS air interfaces in high-density environments."[43] Further, UTAM observes that permitting the use of

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Telephone Cooperative, Inc., Oct. 22, 2001 at 3 (noting that the flexibility to permit isochronous deployment at 1910-1920 MHz would be consistent with their views).

38 *See*, *e.g.*, Avaya Comments at 5; UTAM Comments at 8-9.

39 *See* UTAM Comments at 8.

40 *See id.* at 9.

41 *See* Avaya Comments at 7.

42 *See id*. at 5; UTAM Comments at 12.

43 Comments of the Wireless Information Networks Forum, Inc., Oct. 22, 2001, at 8 ("WINForum Comments") (citing the WINForum Petition for Rulemaking Concerning the Unlicensed Personal Communications Service at Attachment 2, RM-9498 (Jan. 8, 1999) ("Cross-Over Petition")).

the 1910-1920 MHz band would fulfill the Commission's promise to allocate additional spectrum for isochronous UPCS devices,[44] and, as UTAM notes, "the availability of a full 20 MHz for isochronous applications will play a key role in the expansion and future success of the UPCS band."[45]

In light of the record support for increased flexibility in the asynchronous band—as demanded by the increasing needs of isochronous end users—those commenters who oppose WINForum's petition are both (1) in the minority and (2) unsupported by factual evidence. For example, ArrayComm's opposition to WINForum's Petition, based upon its belief that such flexibility would be "expanding the potential of a service that has shown no potential," flies in the face of the record's factual evidence to the contrary, as presented by those who are intimately familiar with the UPCS industry and therefore are in the best position to have knowledge about its potential.[46]

B. While Additional Uses of 1910-1930 MHz Should Be Allowed, Allowing High-Powered Uses Poses a Significant Interference Risk to 2 GHz PCS Operations.

As explained by a number of commenters in this proceeding, the Part 15 etiquette—and the relative assurance of interference-free communications that these strict regulations afford—has been critical to the success of the UPCS band.[47] Accordingly, Motorola continues to

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44 *See* UTAM Comments at 12.

45 *Id.* at 14.

46 Comments of ArrayComm, Inc., Oct. 22, 2001, at 6 ("ArrayComm Comments"). In light of the many mission-critical end user needs served by UPCS devices, Motorola strongly opposes the ill-conceived proposal by the Wireless Communications Association International, Inc. that the FCC immediately freeze UPCS deployment at 1910-1930 MHz. *See* Comments of the Wireless Communications Association International, Inc., Oct. 22, 2001, at 7, n.13. Such an action would result in potentially life-threatening and far-reaching consequences for the many UPCS end-users who rely upon their wireless systems in emergency situations.

47 *See, e.g.,* Avaya Comments at 5-7; WINForum Comments at 5.

believe that while additional flexibility within the 1910-1920 MHz band is advisable and will ensure the more efficient use of available spectrum, the Commission should refrain from permitting higher-powered uses in the UPCS band, as discussed in detail in Motorola's initial comments and as reaffirmed below.[48]

The record evidences overwhelming, shared concern, both by industry members who are strongly opposed to reallocation as well as by those who apparently would advocate reallocation of 1910-1930 MHz—that these frequencies maintain their present function as a guard band against interference with adjacent, licensed PCS operations.[49] As WINForum explains, "the UPCS band was allocated, in part, to create necessary separation to prevent adjacent channel interference from higher power base stations from overwhelming much lower power mobile handsets."[50] Even commenters who appear willing enough for the Commission to reallocate the UPCS band, express reservations.[51] Motorola agrees that permitting the deployment of high-power services in the UPCS band may raise serious interference concerns

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48 For this reason, Motorola continues to reservedly support UTStarcom's proposal to permit the deployment of wireless community networks in rural and underserved areas. While Motorola encourages the Commission to increase flexibility in the UPCS band to permit the more efficient use of this spectrum -- and to ensure that a wide range of wireless products are deployed to consumers -- Motorola maintains that higher-powered uses have the potential to create unacceptable interference either to UPCS operators (should the Commission mandate shared use of the UPCS band) and to adjacent licensed PCS users. Accordingly, Motorola supports the comments of iBee Communications, Inc. and others who advocate slightly higher-powered uses (such as PHS) at 1910-1920 MHz under the conditions that those new entities: (1) participate fully in funding microwave incumbent relocation costs; (2) conform to the listen-before-talk protocol; (3) operate at power levels lower than fully-licensed PCS mobile levels; (4) bear the burden of demonstrating, prior to deployment of operations, that they will not cause interference with UPCS uses; and (5) agree to shut off operations in the event of interference with UPCS operations. *See* Comments of iBee Communications, Inc., Oct. 18, 2001, at 2; Comments of Panasonic, Sept. 28, 2001, at 1-2; Comments of Quantum Communication, Inc., Sept. 25, 2001, at 2.

49 *See, e.g.*, Avaya Comments at 10; WINForum Comments at 9; *see also* Cingular Wireless Comments at 12-13; WCD-TIA Comments at 4.

50 WINForum Comments at 10.

51 *See* Cingular Wireless Comments at 12-13 (noting proximity of 1910-1930 MHz to PCS bands and the concomitant need to guard against interference); WCD-TIA Comments at 4.

and therefore strongly advises against the deployment of higher-power services in the UPCS band—including MDS, high-power TDD, and other higher-power operations. As the Cellular Telecommunications & Internet Association ("CTIA") aptly states, "[i]t may . . . be appropriate for additional flexibility in [the UPCS band] to ensure it is used as efficiently as possible, but any such modification should be done in a way that ensures there is no potential for interference with the adjacent PCS bands."[52] Motorola submits that permitting cross-over use of the asynchronous band by isochronous devices, as described above, is precisely the kind of flexibility that would achieve such efficiency without compromising licensed PCS users.

In light of the foregoing, Motorola strongly opposes both (1) the Ad Hoc MDS Alliance's proposal to relocate UPCS services to 2390-2400 MHz and permit MDS deployment in the 1910-1930 MHz band;[53] and (2) ArrayComm's suggestion that advanced services, using TDD, be deployed at 1910-1930 MHz.[54] The UPCS band, as explained above, simply *cannot* be used for higher-power services, such as MDS or advanced services using TDD, without raising grave technical and interference concerns *vis-à-vis* neighboring PCS licensees. As Motorola's initial comments explain, relocation of the 2150-2162 MHz uplink band to 1910-1930 MHz would result in substantial interference to PCS base stations and subscriber units by MDS customer premise equipment.[55] Furthermore, the record demonstrates that requiring relocation of UPCS, such as to 2390-2400 MHz as proposed by the Ad Hoc MDS Alliance,

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52 CTIA Comments at 3.

53 *See* MDS Alliance Comments at 19-24.

54 *See* ArrayComm Comments at 5-7.

55 *See* Motorola Comments at 17-18.

would strand significant industry and end-user investments in UPCS technology, putting a potentially fatal strain on a nascent and developing industry.[56]

Similarly, Motorola opposes the suggestion by ArrayComm and others that 1910-1930 MHz be used for TDD operations.[57] First, TDD operations are already permitted within this band, provided that they are deployed consistent with the Part 15 etiquette, which is appropriate for the protection of adjacent, licensed PCS users. Second, any higher-power uses are incompatible with this band and will result in harmful and unacceptable interference levels. Even ArrayComm, in its advocacy for deployment of TDD, voices its concern that reallocation would "probably" result in the need for "technical safeguards, such as guardband[s] or filters . . . to protect PCS systems from unwarranted interference."[58] Motorola's initial comments already have shown that higher power TDD is not feasible.[59] As recent contributions to the ITU-R Working Part 8F indicate, even a guard band of 10 MHz may be insufficient to eliminate base station to base station interference; furthermore, the distance between mobile terminals that would be necessary to reduce interference to acceptable levels rules out the

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56 *See, e.g.*, NEC Comments at 14-18 (noting that forcing UPCS to relocate would leave industry consumers "with worthless equipment, thereby stranding their substantial investment in their wireless systems which, in many cases, were purchased only during the last couple of years," and explaining that "[a] reallocation at this stage would eviscerate the reasonable, investment-backed expectations of manufacturers *and* of each end-user enterprise that would be saddled with the tremendous expense and disruption of replacing its wireless systems"); UTAM Comments at 7 (stating that "it is patently evident that any reallocation of the UPCS band would not only undercut the reasonable expectations of members of the UPCS industry, but also the expectations of the hundreds of thousands of end users who have come to reply upon UPCS products"); Avaya Comments at 6 ("Should the FCC decide to reallocate the isochronous band at this juncture, after so much financial and human capital has been invested in UPCS technology, the FCC will be dealing the industry an unexpected and potentially fatal blow.").

57 *See* ArrayComm Comments at 5-7; Cingular Wireless Comments at 12; Comments of Siemens Corporation, Oct. 22, 2001, at 2.

58 ArrayComm Comments at 7.

59 *See* Motorola Comments at 16.

feasibility of TDD systems at 1910-1930 MHz.[60] NEC echoes Motorola's concerns, noting that a recent study under consideration by the Inter-American Telecommunications Commission ("CITEL") indicates that there are "'major concerns over the potential for interference from TDD FWA systems operating in the 1910-1930 MHz band to both the UPCS systems and to licensed PCS systems in adjacent bands.'"[61] The Commission would be ill-advised to ignore the many industry warnings with respect to unacceptable interference caused by higher-powered uses at 1910-1930 MHz. While Motorola agrees that measures can be taken to ensure more efficient use of this band—such as by permitting cross-over use of the asynchronous band—proposals to allow higher-powered uses in the UPCS band, such as by reallocating MDS or permitting TDD operations, are technically unsound.

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60 *See id.* at 16-17.

61 NEC Comments at 20-21 (quoting "Guide on the Results of the CITEL Study to Quantify Issues of Incompatibility Between FWA and PCS in the 1850-1990 MHz Band," CITEL, OEA/Ser.L/XVII6.1, Feb. 22, 2000, at 177).

III. Conclusion

The record in this proceeding provides the Commission with a strong consensus to allocate the 1710-1770 MHz and 2110-2170 MHz bands for 3G services. The Commission and the NTIA should work expeditiously to effectuate this allocation and to ensure that incumbent users are relocated to adequate replacement spectrum with full cost compensation. In addition, the record also provides a firm consensus that while additional operational flexibility is warranted for the 1910-1930 MHz band to support additional compatible wireless uses, the band is not an appropriate home for high-powered operations.

Respectfully submitted,

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